Streamwatch
SMART 3 Colorimeter Testing Guide

STOP! Before commencing ANY water sampling read the safety instructions on the back page

Temperature

1. Hold thermometer in the stream for **1 minute** (ensure casing holes are covered).
2. Where possible and safe to do so, read temperature while thermometer is still immersed in the water.
3. Record result.

Now collect your water sample using your general water sample bottle. Rinse twice before sampling and put aside.

Dissolved oxygen Stage 1 (DO) (Yellow dot)

Gloves and safety glasses must be worn as reagents are hazardous

1. Rinse DO vial (not colorimeter tube) with sample water twice.
2. Recap empty DO vial and immerse horizontally into water.
3. Unscrew lid of DO vial allowing water to enter tube.
4. Turn DO vial upright to release air bubbles and recap vial while it is still in the water.
5. Remove vial from water and turn upside down to check that air bubbles have not been trapped. If air bubbles discard, repeat.
6. **Uncap sample, add 2 drops of Manganous Sulfate and 2 drops of Alkaline Potassium Iodide Azide.**
7. Replace cap and invert DO vial several times (at least 10) to mix.
8. Stand DO vial until precipitate has settled to halfway down vial.
9. **Add 8 drops of Sulfuric Acid to sample water.**
10. Replace cap and invert DO vial several times (at least 10) to mix.
11. Precipitate will now dissolve and sample liquid will turn a yellow colour. Stage 1 is now complete. Put vial aside and move onto Phosphate test.

    If some "brown flakes" remain undissolved after five minutes, add 2 more drops of Sulphuric Acid. Repeat if needed.

Available Phosphate (Blue dot)

Temperature

Equipment Needed:
1. Gloves
2. Thermometer
3. Clean water
4. Paper towel

Dissolved oxygen (DO)

Equipment Needed:
1. Gloves and safety glasses
2. DO sample vial
3. Liquid waste container
4. DO Reagents 1,2,3
5. Clean water
6. Paper towel

DO Reagent #1
(Manganous Sulfate Solution)
Eye contact: Flush eyes with water for 15 minutes, consult a physician.
Ingestion: Induce vomiting immediately, consult a physician.
Skin Contact: Flush thoroughly with water, remove affected clothing, wash skin with soap and water, consult a physician.

DO Reagent #2
(Alkaline Potassium Iodide Azide)
Eye contact: Immediately flush eyes with water for 15 minutes, get immediate medical attention.
Ingestion: Do not induce vomiting immediately, rinse mouth, drink lots of water, call a physician immediately.
Skin Contact: Immediately flush with water while removing affected clothing, rinse skin thoroughly for 15 minutes, consult a physician.

DO Reagent #3
(Sulfuric Acid)
Eye contact: Immediately flush eyes with water for 15 minutes, get immediate medical attention.
Ingestion: Do not induce vomiting immediately, rinse mouth, drink lots of water, call a physician immediately.
Inhalation: Remove to fresh air, give artificial respiration if needed, or give oxygen if breathing is difficult.
Skin Contact: Immediately flush with water while removing affected clothing, rinse skin thoroughly for 15 minutes, consult a physician.

Gloves and safety glasses must be worn, as reagents are hazardous.

1. Shake general water sample bottle to mix.
2. Rinse large 60mL syringe by drawing up and expelling a small amount of sample water **twice**.
3. Draw up about 40mL of sample water with large syringe.
4. Attach round plastic 0.45 micron filter to end of syringe.
5. Expel a little filtered sample water into the phosphate colorimeter tube (blue dot) and blank colorimeter tube (black lid).
6. Replace caps on colorimeter tubes and shake to rinse. Do this **twice**.
7. Fill both colorimeter tubes to the 10mL line with filtered sample water.
8. Set the blank colorimeter tube (black lid) aside (it will also be used for other tests).
9. **Add 1mL (using small syringe) of Phosphate Acid Reagent to the phosphate colorimeter tube (blue dot).**
10. Cap tube and invert several times to mix.
11. **Add 0.1g spoon of Phosphate Reducing Reagent**.
12. Cap and invert to mix, immediately start timer for 5 min countdown.
13. Ensure the powder completely dissolves.
14. Wipe phosphate colorimeter tube and blank tube with clean cloth.
15. Select '78 PHOSPHATE-L' [enter] and insert blank, 'SCAN BLANK' [enter].
16. At precisely 5min insert phosphate colorimeter tube, 'SCAN SAMPLE' [enter].
17. Record results. [Exit] back to testing menu.

Equipment Needed:

1. Gloves and safety glasses
2. General water sample bottle
3. Liquid waste container
4. Clean water
5. Paper towel
6. Microfibre cloth
7. Phosphate colorimeter tube
8. Blank colorimeter tube
9. 60mL syringe
10. 0.45 micron filter
11. 1mL syringe
12. 0.1g spoon
13. Phosphate reagents (1 and 2)
14. Stopwatch
15. Small beaker
16. SMART colorimeter

Available Phosphate Test (Phosphate Acid Reagent)

Eye contact: Immediately flush eyes with water for 15 minutes, get immediate medical attention.
Ingestion: Do not induce vomiting, rinse mouth, drink lots of water, call a physician immediately.
Inhalation: Move to fresh air, give artificial respiration if needed, or give oxygen if breathing is difficult.
Skin Contact: Immediately flush with water while removing affected clothing, rinse skin thoroughly for 15 minutes, consult a physician.

Available Phosphate Test (Phosphate Reducing Reagent)

Eye contact: Flush with water for 15 minutes.
Ingestion: Rinse mouth, drink plenty of water.
Inhalation: Remove to fresh air.
Skin Contact: Rinse skin, wash with soap and water.

Dissolved oxygen Stage 2 (DO) (Yellow dot)

1. Rinse DO colorimeter tube (yellow dot) with a little of the yellow sample liquid. Discard.
2. Fill DO colorimeter tube with sample to the 10mL mark.
3. Fill the blank tube with filtered sample water.
4. Wipe both DO colorimeter tube and the blank tube (filtered sample water) with clean cloth. In colorimeter testing menu select '39 DO' (SMART 2), '038 DISSOLVED OXYGEN' (SMART 3) [enter] and insert blank, 'SCAN BLANK' [enter]
5. Insert DO colorimeter tube, 'SCAN SAMPLE' [enter]
6. Record results. [Exit] back to testing menu.

Equipment Needed:

1. Gloves and safety glasses
2. DO sample vial
3. Liquid waste container
4. Clean water
5. Microfibre cloth
6. DO colorimeter tube
7. Blank colorimeter tube
8. SMART Colorimeter

pH

1. Rinse small beaker **twice** with general water sample water.
2. Fill beaker with sample water.
3. Remove one pH strip from container; do not touch the coloured section.
4. Immerse coloured section into sample water for a few seconds.
5. Shake off excess water, match coloured squares on pH strip to colour scale on container. Read to nearest 0.5 value if possible.
6. Record result.

Equipment Needed:
1. Gloves and safety glasses
2. Small beaker
3. Liquid waste container
4. General water sample bottle
5. pH strips and colour scale
6. Clean water

Electrical conductivity

You need to calibrate the meter before you can test the sample

Calibration of EC meter

1. Shake conductivity standard solution.
2. Rinse beaker **twice** with small amount of conductivity standard solution.
3. Fill beaker to halfway with conductivity standard solution.
4. Turn meter on, immerse probe into beaker without touching the bottom.
5. Swirl meter once, wait until reading stabilizes then read the result.
6. If meter does not read 500 (low range) or 12.9 (high range) then calibrate.
7. Follow calibration instructions on right for your meter type.
8. Re-cap the standard and rinse electrodes with sample water.

Testing sample

1. Shake the general water sample bottle.
2. Rinse beaker **twice** with sample water then fill halfway up beaker.
3. Insert meter (without touching the bottom) and swirl once, wait until reading stabilises then read the result.
4. Record results.

Electrical conductivity

Equipment Needed:
1. Gloves and safety glasses
2. Small beaker
3. Liquid waste container
4. General water sample bottle
5. Conductivity std. solution
6. Deionised water or clean water
7. Conductivity meter

ECScan Meters
1. Press white up or down button found near the batteries, until meter reads 500 (or 12.9 for hi).
2. Wait 3sec until display flashes 3 times and then shows ENT.

Eco Testr Meters
1. Press CAL and wait until display shows a flashing default reading.
2. Press and hold HOLD/ENT button to increase the default reading by increments of 10.
3. Release the button when you have reached the correct value.
4. The meter will flash "Ent" asking if you are happy with the value. Press the HOLD/ENT button if you are. If not, press CAL and repeat steps 2 and 3.

Turbidity (NTU)

1. Assemble turbidity tube.

Turbidity

Equipment Needed:
1. Gloves and safety glasses
2. General water sample bottle
3. Nephelometric turbidity tube
4. Liquid waste container

2. Place tube on flat surface in shade/shadow and keep still.
3. Shake general water sample bottle.
4. Uncap bottle and gradually pour water into the tube.
5. Look directly down the tube to observe the symbol at the bottom.
6. Wait for water level to stabilise before observing the symbol.
7. Stop pouring sample water when you can barely make out the pattern of the symbol, at the bottom of the tube.
8. Read the number below the water level, if the level is between 10 and 15 the result is recorded as 15 NTU, if above 10, record as 10.

Turbidity optional (FTU, FAU) (Brown dot)

1. Either rinse the blank colorimeter tube (black lid) and fill to 10mL line with clean water or continue to use the AP and DO filtered water blank (this is usually fine if the sample water is not >30NTU as measured with turbidity tube.
2. Rinse the colorimeter tube (brown dot) with water from the general sample bottle, twice and then fill to the 10mL line.
3. Wipe both turbidity colorimeter tube and blank tube with clean microfiber cloth.
4. In colorimeter testing menu select '98 TURBIDITY' [enter] and insert blank, 'SCAN BLANK' [enter].
5. Insert turbidity colorimeter tube, 'SCAN SAMPLE' [enter].
6. Record results in site observations (Not in parameters. Note: units are FTU or FAU not NTU, they are not interchangeable) [Exit] and turnoff colorimeter.

Turbidity

Equipment Needed:
1. Gloves and safety glasses
2. General water sample bottle
3. Liquid waste container
4. Clean water
5. Paper towel
6. Microfibre cloth
7. Blank colorimeter tube
8. Turbidity colorimeter tube
9. SMART colorimeter

Safety instructions

Do not proceed if you encounter water contamination like raw sewage, blue-green algae or a chemical spill.

1. Call 000 if the incident threatens human health or property
2. If not needing emergency service, inform the relevant authorities in this order:
   a. EPA Environment Line – 131 555
   b. Sydney Water – 132 090

✓ Sign the Field Sampling Table

✓ Wear personal protective gear

✓ Never test alone

✓ Read all relevant (M)SDS